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ABSTRACT

A study examined the length and characteristics of women's lifetime work experience. The principal data source for the survey was a set of detailed work, educational, marital, and fertility histories that were collected in the fall of 1979 from 564 couples in the Detroit metropolitan area. While prior researchers had relied upon measures of the length of nonwork as a proxy for intermittency in women's work experience, the present researcher employed an exact measure of intermittency. In addition, she introduced a new method of analyzing the following four characteristics of lifetime work experience: the intensity of past work, duration of work with past employers, employer mobility, and intermittency. This method of data analysis confirmed the hypothesis that the presence of children substantially altered women's lifetime patterns of work experience. While the four characteristics of lifetime work experience were shown to be useful descriptive tools for comparing differences in work experience among married women with and without children, they did not, however, add to the understanding of the earnings process for these women. Furthermore, the results suggested that neither the length nor characteristics of work experience prior to tenure was a critical factor for understanding why working mothers earn less than childless women or men. (MN)

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Abstract

The Length and Characteristics of Women's Lifetime Work Experience

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The intermittency of women's work experience has been a major and influential explanation of the wage gap between the sexes. No prior researchers, however, have had data to measure intermittency exactly. Instead of examining multiple labor force entries and exits, prior researchers have relied upon measures of the length of nonwork as a proxy for intermittency. In this analysis, an exact measure of intermittency is employed. In addition, I introduce a new method of analyzing four characteristics of lifetime work experience (the intensity of past work, duration of work with past employers, employer mobility, and intermittency). Hypotheses posed for these characteristics are supported. But the measures of characteristics are highly collinear with the length of past work experience which hampers their use in general linear models. Intermittency is not found to influence the current earnings of women in the sample studied, although the results of other variables used in the earnings equation support earlier findings.

Introduction

Efforts to explain the wage gap between the sexes have been inconsistent and only partially successful (Suter and Miller, 1973; Malkiel and Malkiel, 1973; Oaxaca, 1973; Mincer and Polachek, 1974; Corcoran and Duncan, 1979; Taylor et al., 1981). Women's work experience has been a promising factor in that explanation, since the quantity and quality of their experience is thought to be substantially different from men's.

Intermittency, or the idea that women go in and out of the labor force in response to marriage and childbearing, has been the major explanation of the wage gap. No prior researchers, however, have had data to measure intermittency exactly. Instead of examining multiple entries into and exits from the labor force, most prior researchers have relied upon measures of the length of nonwork as a proxy for intermittency.

In this analysis, an exact measure of intermittency is employed. In addition, I introduce a new method of analyzing three additional characteristics of lifetime work experience. At issue is the distinction between the length of work and nonwork on the one hand, and the characteristics of lifetime work experience on the other hand. I argue below that measures of length are insufficient to capture the detail of individuals' work histories that may have consequences for earnings.

The results support most of the hypotheses posed for characteristics of lifetime work experience. Intermittency in past work experience is not found to have a negative influence on the later earnings of women in this particular sample. Measures of work experience characteristics, however, are highly collinear with the length of past work experience, which hampers their use in general linear models.

This paper is presented in five parts. I begin by discussing prior research on the relationship between women's lifetime work experience and earnings. Then hypotheses for characteristics of lifetime work experience are presented. In the third and fourth sections I discuss the data and sample which are used in this investigation and define the basic measures of lifetime work experience. Finally I examine and compare the results for three groups of women.

I. Review of Prior Research

Mincer and Polachek's theoretical work put a great deal of emphasis on the extent to which intermittency in women's work lowers their wages. They characterize intermittency as the "discontinuity of work experience" due to "several entries into and exits from the labor force after leaving school." Intermittency is attributed to women's traditional domestic and child caring responsibilities in families' divisions of domestic and market labor.

But in their analysis, Mincer and Polachek do not measure intermittency directly. Rather, they include measures of the length of work and nonwork between predetermined lifetime events (e.g., school, marriage and the birth

of the first child). The length of work in the NLS data that Mincer and Polachek use was defined as the number of years a woman worked six months or more. But if women's jobs are intermittent and of short duration, as Mincer and Polachek suggest, then many jobs which lasted less than six months were not counted as work, and therefore the length of work experience is likely to have been underestimated. They found that spells of nonwork were negatively related to later earnings and that spells of work were positively related to later earnings.

Corcoran (1978) improved on Mincer and Polachek by including a direct measure of intermittency--a dummy variable indicating that an individual experienced two or more interruptions of a year or longer in the prior worklife. In addition, she included measures of the length of spells of work and nonwork (which were not bounded by predetermined lifetime events). She found that the continuity of work experience and the frequency of labor force withdrawals did not significantly affect later earnings.

In both Corcoran's and Mincer and Polachek's analyses, the intermittency of past work experience is hypothesized to have the following consequences:

1. Less human capital investment (i.e., general and specific training) occurs overall for those with discontinuous labor force participation;

2. The timing of human capital investment is different over the lifetime;

3. Human capital, especially general training, depreciates in value during spells of nonwork; i.e., work skills "get rusty" or "atrophy" in periods of nonuse.

Empirical support for the first two hypotheses is well-established. Women with children, who are most likely to have discontinuous work experience, accumulate less work experience overall than women without children. In the 1967 NLS data, white married women ages 30-44 with children worked on average 6.4 years, whereas white married women of the same ages without children averaged 14.5 years of work (Mincer and Polachek, p. 403).

With regard to the second hypothesis, the rate of human capital investment is expected to decline monotonically over the worklife for groups with continuous labor force participation (Mincer and Polachek, pp. 410-414). For those with discontinuous participation, human capital investments (such as job training and firm specific work experience) are expected to be concentrated later in life. Mincer and Polachek found that investments were higher for white married mothers after children reach school age than prior to marriage. In contrast, women without children were found to invest more heavily early in life. Thus discontinuities in work experience due to childbearing do appear to affect the timing of human capital investments over the lifetime.

Empirical tests of the depreciation hypothesis have produced mixed results. Mincer and Polachek interpret negative coefficients on spells of nonwork as the depreciation of work skills. But in a replication of Mincer

and Polachek, after correcting for coding errors in NLS work history data, Sandell and Shapiro (1978) found that the size of those coefficients dropped by a factor of three and became insignificant.[1] In another replication using the PSID data, Corcoran (1978) found negative coefficients on home time for women aged 30-45, like Mincer and Polachek, but these results disappeared when the same model was applied to women aged 18-64. More recent work by Mincer and Ofek (1981), using longitudinal data, finds that women are penalized for intermittency upon reentry into the labor force, but these penalties soon evaporate with continued work.

The inconsistency of empirical support regarding the depreciation hypothesis suggests that the concept of lifetime work experience has not been fully explored. In the following paragraphs, the concept of intermittency is elaborated and additional characteristics of past work experience are developed.

II. Hypotheses for Characteristics of Lifetime Work Experience

The goal of the discussion below is to demonstrate that the length of work and the length of nonwork are not sufficient to capture the detail of individuals' work histories which may have consequences for earnings. Rather, I argue below for measures which characterize work experience, and these measures are hypothesized to affect later earnings net of the effects of the length of work and nonwork.

Intermittency. Intermittency is defined (but not operationalized) by Mincer and Polachek as multiple entries into and exits from the labor force. Similarily, Corcoran measures intermittency as two or more interruptions of a year or longer in past work experience. Defined in this way, intermittency is a characteristic of lifetime work experience which should have a negative effect on later earnings, over and above the effects of the length of work experience and the length of time spent out of the labor force. Substantively, this means that a woman who has accumulated 200 months of work experience in several spells of work will receive lower returns to that experience than another woman who has accumulated 200 months of work experience by working continuously.

While intermittency is a valuable and intuitively appealing concept, there are additional ways of characterizing lifetime work experience which may add to the understanding of the effects of experience on later earnings. Below, three such measures are introduced: employer mobility, duration of work with an employer, and intensity of work.

Employer Mobility. The concept of intermittency may be usefully distinguished from multiple employers within a spell of work. Intermittency is a measure of the number of discrete spells of work, but workers may have several employers within one continuous spell of work. Employer mobility may be conceived as the number of employers within one continuous spell of work.

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[1] Despite Sandell and Shapiro's results, Mincer and Polachek's findings have been very influential in policy making (U.S. Council of Economic Advisors, 1973, 1974; U.S. Department of Labor, 1974).

Employer mobility may operate in very different ways in an individual's worklife, and each way could have vastly different consequences for later earnings. First, multiple employers within a spell of work may be viewed as strategic job-changing. Workers may change employers to move up occupational ladders and to take advantage of new opportunities (e.g., higher earnings, greater prestige, and more promotion opportunity). Strategic job-changing may augment an individual's human capital and result in higher earnings later on.

On the other hand, employer mobility may be viewed by employers as job instability. Frequent employer changes with a spell of work may be due to dissatisfaction with earnings, promotion opportunities, hours, or job tasks. This kind of employer mobility is unlikely to augment workers' general or specific training, and may result in being labelled unreliable by potential employers.

The effects of employer mobility, net of intermittency, on later earnings will tell whether employer changing is rewarded or penalized. When intermittency is low (i.e., when work experience is virtually continuous), the number of employers per spell is likely to be high, since the duration of spells will be longer and therefore the opportunity to change employers will be greater. In this case, intermittency is unlikely to be penalized. Working women without children are expected to fit this scenario.

When intermittency is high, the number of employers per spell is likely to be low, since the duration of spells will be shorter. Employer mobility in short spells of work is not expected to augment human capital, and should be negatively related to later earnings. Women in this case are expected to be penalized for intermittency and months spent out of the labor force, since the quantity and quality of their work experience will be lower than that of women with continuous experience. Working women with children are expected to fit this scenario.

High intermittency and high employer mobility in past work experience is expected to be negatively related to later earnings, regardless of the length of experience, indicating that a woman has accumulated little general or specific training. Low intermittency and low employer mobility should be rewarded, indicating that a woman has had long attachments to a couple of employers and will therefore receive the benefits of firm-specific training, tenure, and seniority.

Duration. Another measure of work experience that is expected to affect later earnings is the duration of work with employers. The length of time spent with an employer indicates the degree of seniority and tenure within a firm, as well as the amount of firm specific training received. Duration with past employers may influence prospective employers' hiring decisions and current employers' training decisions; that is, women with greater duration with past employers are likely to be viewed as more reliable and as better risks for on-the-job training than women with short duration with past employers. Thus, there is reason to expect an effect of duration on earnings net of past work experience and tenure.

The positive effect of the duration of past work experience on current earnings should be greatest for "job stayers", that is when duration is long, employer mobility low, and intermittency low. Short duration may actually count against later earnings, especially if it is combined with high employer mobility and high intermittency. Between these extremes, the effect of duration on earnings is expected to be moderately positive.

Intensity. A final characteristic of work experience has already been found to influence later earnings: the intensity of past work. Corcoran (1978) and Corcoran and Duncan (1979) found that the proportion of years spent working full time significantly increased later earnings. Although their measure was crude, it is suggestive. Women who work part time may not accrue that same kind of firm specific training as women who work full time. Part time work may also signal that women are constrained by location and by other family members' schedules, so that their mobility may be limited and they may be unable to find or accept full time work.

For women who accumulate the same total months of lifetime work experience, the relative effects of part time versus full time work may encompass the following possibilities:

1. There could be no difference; i.e., 200 months worked part time may be worth the same amount to later earnings as 200 months worked full time. Corcoran's and Corcoran and Duncan's results suggest that this possibility is unlikely, but again, their measure was crude.

2. Part time work may be worth proportionally less; i.e., 200 months of half time work may be worth half as much to later earnings as 200 months worked full time.

3. Part time work may be worth little or nothing at all. This will be true if employers assume that part time workers have only a marginal attachment to work and therefore do not invest in training part time workers, or if subsequent employers discount part time work.

In fact, the effect of part time work on later earnings is expected to be contingent on the duration of work, employer mobility and intermittency. Ten years of part time work with one employer is likely to be worth more than ten years of part time work with several employers broken by spells of nonwork. The former case is likely to be worth less than ten years of full time experience with one employer. The many permutations await empirical analysis, but the intensity of past work, controlling for all other factors, is always expected to be positively associated with earnings.

III. Data and Sample

The work history data required to test hypotheses for intermittency, duration, employer mobility and intensity must be highly detailed, covering jobs, employers, hours and months worked, etc. The Panel Study of Income Dynamics and the National Longitudinal Study of Mature Women have detailed information on women's work experience for the periods the women were in the study. But they have only crude measures of experience prior to the studies (e.g., "How many years did you work six months or more between school and marriage?").

Detailed, retrospective work histories on a large, national sample are not available.

The data used in this investigation were gathered in Fall 1978 by the Survey Research Center of the Institute for Social Research at the University of Michigan.[2] Lengthy and detailed interviews were conducted with 314 married couples in the Detroit metropolitan area. Detailed work, educational, marital and fertility histories were obtained for both husbands and wives.[3] Only the data for wives is examined in this analysis.

The sample was stratified into three types of married couples: Type I's are dual career couples without children; Type II's are dual career couples with children; Type III's are single career couples (husband working) with children. These three types of couples are assumed to represent "ideal types" across a range of internal divisions of labor within families. See the Appendix for further discussion and description of the three types of couples.

All of the women in the sample are white, aged 30-45 in 1978, married at least five years, and (if dual career) were employed 20 or more hours per week for pay in the prior year. The childless women in comparison to those with children are generally younger, better educated, married later, have higher earnings and combined family incomes, and have had less exposure to the labor market since high school. Differences between the working and non-working women with children are slight, but suggest that Type II's may be at a later stage in the family life cycle.[4] These differences may be related to differences found in patterns of lifetime work experience.

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[2] The survey was called "The Study of Family Life" and was conducted with a grant from the National Institutes of Mental Health to Karen E. Paige, Associate Professor of Psychology, University of California at Davis. The author and Elizabeth M. Magnus had primary responsibility for the data-gathering tasks. The data are used with the permission of Dr. Paige.

[3] In order to catch potential errors of recall, intra-individual work, educational, marital and fertility histories were compared, and respondents were contacted on the telephone to correct seeming inconsistencies (e.g., when a respondent reported going to school full time and simultaneously working full time).

[4] Type II's have been married one year longer, on average, and the average age of their children is two years older.

IV. Definition of Lifetime Work Experience Measures

Seven measures of lifetime work experience were derived from information on jobs. First, four measures were created which characterize lifetime work experience:

1. Intensity: Average hours of work per month of work since high school;
2. Duration: Average months of work per employer since high school;
3. Employer mobility: Average number of employers per spell of work since high school;
4. Intermittency: Number of spells of work since high school.

Then, three mutually exclusive, but not uncorrelated, measures of the length of time spent working and not working were created:

5. Out of Labor Force: Months spent not at work or school;
6. Tenure: Months of tenure with the 1977 employer;
7. Prior experience: Months of work experience prior to tenure with the 1977 employer.

The first four measures of lifetime work experience were derived from total hours of work from the end of high school to the date of the interview (W_i). To create W_i, number of hours worked per week on each job was multipled by the number of months worked on each job, times 4.333 (assuming there are 4.333 weeks in each month):

$$W_i = \sum_{j=1}^{12} h_{ij} * [m_{ij} + (y_{ij} * 12)] * 4.333$$

where for woman i:

h_{ij} = hours per week in job_j;
h_{ij} = months worked in job_j;
h_{ij} = years worked in job_j.

W_i was then broken down into the four components which characterize lifetime work experience. These components may be represented in the following way:

$$W_i = \bar{H}_i * \bar{D}_i * \bar{E}_i * S_i = \frac{W_i}{m_i} * \frac{m_i}{e_i} * \frac{e_i}{S_i} * S_i$$

where, for the i-th woman, since leaving high school:

W_i = total hours worked;

$\bar{H}_i$ = average hours of work per month of work;

$\bar{D}_i$ = average months of work per employer;

$\bar{E}_i$ = average number of employers per spell of work;

S_i = total number of spells of work;

m_i = total number of months of work;

e_i = total number of employers.

Total work experience, W_i, is defined as the product of the four components given above. Each of these components addresses theoretical issues presented in the prior section. $\bar{H}_i$, average hours of work per month, captures the intensity of work experience. $\bar{D}_i$, average months of work per employer, captures the duration of work. $\bar{E}_i$, average number of employers per spell of work, is employer mobility. S_i, the number of discrete spells of work since the end of high school is intermittency.

Total months of work since high school, m_i, was calculated as simply the sum of years (times 12) and months on each job. Intensity, $\bar{H}_i$, was then calculated as the quotient of W_i/m_i.

The number of employers, e_i, each woman worked for was estimated as the sum of discrete jobs held in the lifetime, minus promotions and lateral transfers within a firm. The job duration measure $\bar{D}_i$, average months of work per employer, was then calculated as the quotient of m_i/e_i.

Number of spells of work since high school, S_i, was determined using information on what a respondent did after she left a job. A spell was counted each time a respondent left a job and 1) did not go directly into another job, 2) did not continue to work at a second, simultaneously held job, and 3) did not go back to school or job training.[5]

The measure of intermittency is thus S_i, number of spells of work since high school. $\bar{E}_i$, number of employers per spell of work, is the quotient e_i/S_i.

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[5] The latter condition was applied because many women reported having several short-term summer jobs while in college. Spells of nonwork for training or educational purposes are investments in human capital; to include these spells in the measure of intermittency would contaminate a test of the depreciation hypothesis. In sum, S_i is a measure of the number of spells of continuous work experience and, for women who worked during college, spells of investment in human capital. Time spent between spells can then be considered time spent out of the labor force and time not investing in human capital.

Months spent out of the labor force (OLF) was calculated as total months since high school minus months worked and months in school.[6] Therefore, time spent out of the labor force maybe considered time spent not investing in human capital.

Tenure in 1977 was defined as months of tenure with the 1977 employer prior to January 1977. It was measured as total months worked for the 1977 employer (or longest 1977 employer) minus months worked for that employer in 1977.

Months of lifetime work experience prior to experience with the 1977 employer was calculated as simply total months of work experience (m_1) minus tenure, minus months worked since January 1977.

In sum, seven measures of lifetime work experience will be examined. Four of these measures--intensity, duration, employers per spell, and spells--can be considered measures which characterize lifetime work experience. The others--months out of the labor force, experience prior to tenure, and tenure--are direct measures of the length of lifetime work experience. In the next section, these measures are examined and compared for the three types of women.

V. Results

A. Descriptive Discussion of Lifetime Work Experience

The childless Type I women are likely to have built their worklives around childlessness, and are expected to adhere closely to the traditional male model of human capital investment and continuous work experience. Thus childless women should have had more intense lifetime work experience, greater duration of work per employer, and less intermittency in their work histories than did working women with children, the Type II's. To test this, I compared the means of the lifetime work experience measures of the Type I and II women, using simple t-tests of the null hypothesis that the means are the same (see Table 1).

The comparisons confirmed all expectations. Even though the Type I women were exposed to the labor force for a significantly shorter period than the Type II women, they worked significantly more months. The Type I women, on average, spent 90 percent of the months since high school working. In contrast, the Type II women worked only 59 percent of the same period.

The intensity of work was also greater for childless working women than for working women with children. The average Type I woman worked 162 hours per working month, while the average Type II woman worked 147 hours per working month.

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[6] Months spent in college was derived from complete college education histories.

With regard to duration of employment, the women without children averaged 47 months per employer for 5.25 employers over the lifetime. Although the women with children had about the same number of employers, they averaged only 28 months per employer, significantly less.

Employer mobility was also significantly higher for women without children than women with children (3.3 employers per spell versus 2.1). This is not so surprising, however, considering that the average length of spells for the Type I women is more than twice as long as for the Type II's: 115 months compared to 54 months, respectively.

With regard to intermittency, women without children averaged just two spells of work in the lifetime (excluding jobs left to return to school). Only 4.25 months were spent, on average, between the two spells. The working women with children averaged three spells of work, with 77 months out of the labor force distributed between the three spells of work. Both months out of the labor force and number of spells were significantly greater for Type II than Type I women.

In sum, for the characteristics of lifetime work experience measures, the Type I's have worked longer, more intensely and more continuously than the Type II women, as was hypothesized. This, despite the fact that childless Type I women left high school 3.5 years later than Type II women with children.[7] In addition, Table 1 shows that childless women averaged significantly greater tenure and hours of work in 1977, as well as somewhat greater work experience prior to tenure. The major factor distinguishing the Type I's from the Type II's is the absence of children. These results confirm that the presence or absence of children is related to important differences in women's patterns of lifetime work experience.

Among women with children, those working (Type II's) and those not working (Type III's) differ only on suggestive evidence that the Type II's are at a later stage of the family life cycle than the Type III's. On the basis of this evidence, the Type II women should exhibit more hours, months, employers and spells of work. But there is no a priori reason to expect that the intensity, duration, or intermittency of work should be different.

The Type II and Type III women differed significantly, however, on nearly every measure of lifetime work experience (see Table 1). The Type II women have been out of high school for 234 months on average and worked 137 (59 percent) of those months. The Type III women have been out of high school for 222 months, but worked only 71 months (32 percent).

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[7] These work experience differences may be due, in part, to the fact that the Type I women were married 2.5 years later on the average than the Type II's and in that time were able to accumulate more work experience. But this potential headstart in work must be offset to some degree by the fact that the Type I women averaged 1.5 years more in school than the Type II's.

Although the nonworking women with children averaged only 71 months of work in the lifetime, compared to 137 months for working women with children, the intensity of their work was greater. They averaged 156 hours per working month, significantly greater than 147 hours per working month for the Type II's. This indicates that working women with children were more likely to work part time.

The duration of past employment was also longer for the Type II's than the Type III's. The Type II women averaged 28 months per employer for 5.6 employers, whereas the Type III women averaged only 22 months per employer for just four employers. Both mean differences are statistically significant.

There is no significant difference in the number of employers per spell for the Type II and III women but, as discussed above, the Type II women averaged one more spell of work over the lifetime. This suggests once again that the Type II's are at a later state of the family life cycle.

B. Regression Equations for 1977 Earnings on Lifetime Work Experience

In estimating the effect of intensity, duration, employer mobility and intermittency on 1977 earnings a twofold strategy used. First, they are examined in earnings equations controlling for length of work and nonwork, 1977 hours, promotion(s) received with current employer, and education (Full Model A):

$$(A)\quad 1977\$ = \alpha_i + \beta_1 H_i + \beta_2 D_i + \beta_3 E_i + \beta_4 S_i$$

$$+ \gamma_1 OLF_i + \gamma_2 Exp_i + \gamma_3 Ten_i + \delta_1 Hrs_i + \delta_2 P_i + \delta_3 Ed_i + \varepsilon$$

where, for women i:

$1977\$_i$ = dollar and log dollar 1977 earnings;

Characteristics:
- H_i = intensity;
- D_i = duration;
- E_i = employer mobility;
- S_i = intermittency;

Length:
- OLF_i = months out of labor force;
- Exp_i = months of experience prior to tenure;
- Ten_i = months of tenure with current employer;

Control:
- Hrs_i = hours worked in 1977;
- P_i = dummy variable for promotion(s) received with current employer (1 = promotion);
- Ed_i = years of education.

Then, intensity, duration, employer mobility and intermittency are excluded from the earnings equation to determine whether these characteristics of lifetime work experience significantly increase the variance explained in the basic human capital model (Reduced Model B):

$$(B)\quad 1977\$ = \alpha_i + \gamma_1 OLF_i + \gamma_2 Exp_i + \gamma_3 Ten_i + \delta_1 Hrs_i + \delta_2 P_i + \delta_3 ED_1 + \varepsilon$$

The goals of this strategy are: 1) to examine the relationship of intensity, duration, employer mobility, and intermittency to earnings net of length of work and nonwork; 2) to determine whether inclusion of these measures significantly improves a basic human capital model of earnings; and 3) to examine how the earnings functions are different for women with continuous and discontinuous work histories. Both metric dollar and log dollar earnings equations are presented.

Table 2 presents the results of the full and reduced regression equations.[8] With one exception the coefficients on intensity, duration, employer mobility and intermittency in the full model are not significantly different from zero. (The exception is intensity for childless women in the log dollar model.) Not surprisingly then, in comparing the full and reduced models in the lower panel of Table 2 with an F-test, I cannot reject the null hypothesis that the coefficients for these measures are zero. Substantively, these results mean that intensity, duration, employer mobility, and intermittency in past work experience add nothing to the understanding of married womens' current earnings, beyond a basic human capital model.

The lack of significance of the characteristics variables may be due to the small sample size. Or, it may be because intensity, duration, employer mobility and intermittency are, as a group, highly multicollinear between themselves or with other variables in the equation.[9] The effect of multicollinearity is to inflate the standard errors of the regression coefficients, making t-tests unreliable. To test for multicollinearity among groups of predictors, each of the independent variables is regressed on all others and the coefficients of determination (R^2s) are compared. The rule of thumb suggested by Farrar and Glauber (1967) is that R^2s greater than .8 indicate serious multicollinearity. (This rule of thumb is not without controversy, however.) For intensity, duration, employer mobility and intermittency, each regressed on all other predictors, the R^2s are respectively for Type I's .34, .71, .73 and .61, and for Type II's are .24, .70, .62 and .63. The latter three for each group are high enough to suggest that multicollinearity among groups of predictors is the source of the lack of significance of these predictors.[10]

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[8] Type III are excluded from the earnings equations, since they were not working at the date of the interview.

[9] An examination of the zero-order correlation coefficients among the regressors indicated that there was little likelihood of multicollinearity due to high correlations among individual predictors.

[10] Heteroscedasticity in the residuals is not the source of bias in these results. Scatter plots of the residuals by predicted values of earnings did not show the characteristic patterns of heteroscedasticity.

In conclusion, the characteristics of past work experience do not add significantly to a basic human capital model of earnings for either women with nearly continuous work experience or for those with discountinuous work experience. The insignificance of the results is most likely due to multicollinearity among groups of predictors in the model. I conclude that the reduced model provides the most parsimonious explanation of earnings for these women.[11]

Turning to the reduced models, the regression coefficients for months out of the labor force are in hypothesized directions for both groups of women (see Table 2), but they are insignificant net of the other variables. The positive coefficient for childless women suggests that they engage in strategic job-changing when out of the labor force, or that there is a threshold where time spent out of the labor force begins to be penalized which Type I's have not reached yet. The negative, but insignificant, coefficient for working women with children can only suggest that their skills may be deteriorating when out of the labor force and out of school, or that they are penalized by later employers for a perceived lack of commitment to working.

Childless women are highly rewarded for tenure, and positively but insignificantly rewarded for experience prior to tenure and months out of the labor force. These results are very similar to Mincer and Polachek's results (1974, p. 411) for white married childless women who were aged 30-45 in 1967. They too found significant rewards to tenure but insignificant rewards to prior experience.[12]

Women with children are not significantly penalized for months spent out of the labor force, and they are not significantly rewarded for tenure or experience prior to tenure. Both Corcoran (1978) and Mincer and Polachek found that white married women aged 30-45 with children were significantly penalized in later earnings for months spent out of the labor force. But Sandell and Shapiro's (1978) reanalysis of Mincer and Polachek on corrected data found the sign of the coefficient to be insignificant and negative, like mine.

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[11] The regression coefficients in the reduced models for Experience prior to tenure, Tenure, 1977 Hours, and Education are significantly different from their counterparts in the full models for both groups of women. The instability of these coefficients is further evidence of multicollinearity among groups of predictors.

[12] A difference between my results and theirs is that Mincer and Polachek's coefficient on years out of the labor force was negative and insignificant, compared to my positive and insignificent coefficient on months out of the labor force and out of school. This difference is probably due to the fact that this group of women in the NLS averaged 40 months out of the labor force and my childless women averaged only four; and, in turn, this difference may be a period effect--the women in their sample were aged 30-45 seven years before the women in this study were.

The coefficients on tenure werepositive and significant in all three of the cited studies, as was the coefficient on prior experience for two of the three studies. This suggests that insignificant, positive coefficients on tenure and prior experience for my women with children may be due mainly to the small sample.

The control variables demonstrate that working women with and without children are rewarded about the same for an extra hour of work, net of work experience and other factors. But education and having received a promotion is significantly rewarded for childless women and not for those with children.

Conclusions

These results confirm that the presence of children substantially alters women's lifetime patterns of work experience. Employed women without children (Type I's) worked longer than employed women with children (Type II's), despite the fact that they have had fewer years in which to work. Childless women also worked more intensely and more continuously in the past, and have worked longer and more intensely for their current employers than employed women with children. Finally, the women without children earned substantially more than the women with children.

Working women with children (Type II's) also had different patterns of lifetime work experience than nonworking women with children (Type III's). Type III's averaged less duration but greater intensity of work with past employers than Type II's, and they spent more time out of the labor force and out of school. These differences suggest that some women choose to work part time while raising children, while others choose to not work at all. There is also some evidence that these differences could be because the Type II's are at a later stage of the family life cycle than Type III's.

In the multivariate analyses, characteristics of work experience did not add significantly to a basic human capital model of earnings which controlled for months out of the labor force, months of tenure, months of prior experience, hours worked in 1977, education, and promotions received with the current employer. The lack of significance is probably due to multicollinearity between the characteristics of work experience and other predictors in the model.

In the reduced earnings equations, childless women were found to be highly rewarded for tenure, and positively but insignificantly rewarded for prior experience and months out of the labor force. Working mothers were not significantly penalized for months out of the labor force, and were not significantly rewarded for tenure and prior experience. These results are similar to those found in previous studies.

Finally, childless women were highly and significantly rewarded for each additional hour of work in 1977, for each additional year of education, and for having received a promotion with the current employer. Working mothers, however, were only significantly rewarded for hours of work in the reduced equations.

In sum, characteristics of lifetime work experience (intensity, duration, employer mobility, and intermittency) were shown to be useful descriptive tools for comparing differences in work experience of three groups of married women. They did not, however, add to the understanding of earnings process for these women, net of the effects of the length of lifetime work experience. Further, the results suggest that neither the length nor characteristics of work experience prior to tenure is a critical factor for understanding why working mothers earn less than childless women or men.

These results add to the growing body of evidence that suggests that intermittency in women's past work experience is not a major factor in the explanation of the wage gap between the sexes. The implication of these results is that an important step in explaining the wage gap would be to focus on employers' hiring and wage determination decisions, with particular emphasis on how employers use information on women's past work experience and parenthood status to make such decisions.

Appendix: Description of the Sample

A crucial link in explaining sex inequality in earnings is the joint decision made by married couples about how to allocate their productive and reproductive resources. Since the range of sexual divisions of labor in families is highly skewed toward one end of the continuum (i.e., dividing joint resources between husbands' market achievement and wives' reproductive-related work in the home), only a very large probability sample would produce enough couples representing the entire range of internal divisions of labor. In order to represent a range of internal divisions of labor within families, the three types of couples were identified and sampled independently. A brief description of these couples follows.

The first type of couple, the Type I's (n=70), is the "rare element" in the U.S. population. In these dual career couples without children, each spouse worked 20 or more hours per week for the year prior to the interview, they have delayed childbearing for at least five years of marriage, and at age 30 or more, they are unlikely to have children later on. Couples with these characteristics represent that end of the continuum of internal divisions of labor in which the resources of both spouses are concentrated on market achievement and are not at all devoted to reproduction. For the purposes of the study at hand, the Type I women are likely to have built their worklives around childlessness (by choice or subfecundity). They are expected to adhere most closely to the male model of human capital investment over the lifetime and have nearly continuous work experience. If any group of married women comes close to closing the wage gap between the sexes, it should be this one.

The Type II couples (n=123) have children and both partners work 20 or more hours per week. They represent the middle range of the division of labor continuum, in which wives' resources are divided between home production and market production. The work experience of this group of women is particularly important to understand, because married women with children present have accounted for the largest percentage of the rate of increase in women's labor force participation since World War II, and because the sex-wage gap is widest for them. While it is true that many married women work less than 20 hours per week, it was beyond the financial constraints of this study to adequately represent in the sample all categories of part time work. Comparison of the Type I and II women allows me to determine how children, net of marriage, affect women's work and earnings.

The Type III couples (n = 121) represent modal U.S. couples who split their joint resources between husbands' market achievement and wives' reproduction-related work in the home. The Type III women did not work at all for pay in the year prior to the interview. A comparison of these women's patterns of lifetime work experience to the Type I's and II's enable me to pinpoint determinants of variation in married women's work experience and later earnings.

In the sample screening procedures, respondents were selected on additional criteria to effectively "hold constant" (or eliminate the effects of) variables not central to the study, namely, region, race, age, educational levels, and marital stability. The regional restriction to the Detroit tri-county area controls for labor market variations which would have been impossible to control with a national sample of this size. The focus upon white women is consistent with previous studies, which have found the effect of experience on later earnings to be small for black women (Mincer and Polachek, 1974; Corcoran, 1978). The age range of the sample, 30-45 years, allows comparability to the NLS sample of mature women (used by Mincer and Polachek) and increases the probability that currently childless women in the sample are also future voluntarily childless women, not delayed parents. (The work patterns and human capital investments of women who anticipate childbearing may be different from those who don't.) For a sample of 314 couples, not holding constant these characteristics would seriously impair adequate testing of the basic models.

The original sample of 314 married women was reduced to 299 (-5 percent), due to 13 cases with serious coding errors, one case where the woman was too young, and one woman who refused to answer the work history questions. Across Types of women, two Type I's were omitted (3 percent of the group), seven Type II's were omitted (6 percent), and six Type III's were omitted (5 percent). Thus, the final sample size for each Type is, respectively, 68, 116 and 115.

Because of the unusual sample, selection bias would be an intrinsic problem in the analysis if I sought to estimate parameters for the entire population of women. The focus of the proposed study, however, is to examine different patterns of work experience for three specific kinds of women, and to examine the relative effects of different patterns of work experience on occupational segregation over the worklife. The focus is not to provide descriptive or baseline information about the correlates of sex inequality in the American population of women as a whole. If the results of this study support my hypotheses regarding women's lifetime work experience, then future research should examine the hypotheses' contribution to explaining sex inequality in the population as a whole.

Nevertheless, I explored the degree to which the types of married women are represented in the Detroit SMSA and in the nation as a whole. The 1978 Current Population Survey and the 1974 Detroit Area Survey were used to examine 1) the frequency distribution of the three types of married women in the Detroit SMSA and in the nation, and 2) how representative this sample is of the three types of married women in the Detroit SMSA and in the nation. Insofar as possible, women were selected from these two data sets using the criteria that defined the three sample groups.

As expected, this examination revealed that the Type I and II women are rare in the population, and that the average characteristics of the three types of women in the study were little different from the average characteristics of the three types of women in Detroit.

Type I's in the nation are somewhat older and less educated than Type I's in Detroit. Type I's and II's in the nation work more hours but earn less than comparable women in Detroit. And mothers in Detroit tend to have more children than mothers in the nation. Thus, results for Type I's and II's from the study should be generalized cautiously, unless the differences between Detroit women and women in the nation can be reasonably taken into account. But the study sample of Type III women can be generalized to the nationwide population of Type III women.

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Table 1: Work Experience Measures (Type I's working, childless; Type II's working with children; Type III's nonworking, with children)

	Type I		Type II		Type III		t-Tests of dif. in means, I's and II's[1]	t-Tests of dif. in means, II's and III's[2]
	$\bar{X}$	S	$\bar{X}$	S	$\bar{X}$	S		
Lifetime Work Experience								
Intensity (W_i/m_i)	162	23	147	31	156	37	3.40*	2.02*
Duration (m_i/e_i)	47	38	28	18	22	21	4.62*	2.22*
Employer Mobility (e_i/S_i)	3.29	2.39	2.13	1.60	2.08	1.44	3.93*	.27
Intermittency-# Spells(S_i)	2.01	1.19	3.09	1.34	2.20	1.40	5.48*	4.95*
Months Out of Labor Force	4.25	8.80	77	70	131	75	8.65*	5.60*
Tenure in Months 1977	66	46	41	42	--	--	3.77*	--
Experience in Months	106	60	96	55	--	--	1.17	--
1977 Hours	1,971	390	1,623	650	--	--	4.01*	--
Promotion w/Employer	.265	.444	.155	.364	--	--	1.81	--
Hours Worked (W_i)	28,031	10,471	20,680	9,774	11,569	7,688	5.19*	7.35*
Months Worked (M_i)	172	57	137	63	71	45	3.87*	9.14*
Number Employers (e_i)	5.25	2.73	5.57	2.38	3.90	2.29	.83	5.41*
Months per Spell	115	71	54	43	42	38	7.34*	2.16*

[1] d.f. = 182
[2] d.f. = 229

*$p < .05$

Table 2: Regressions of 1977 Earnings (Dollar and Log Dollar) on Predictor Variables for Type I and Type II Women (Type I's are childless; Type II's have children) (t-Statistics in parentheses)

		Dependent Variable: Dollar Earnings				Dependent Variable: Log Dollar Earnings			
		Type I		Type II		Type I		Type II	
		Full Model	Reduced Model	Full Model	Reduced Model	Full Model	Reduced Model	Full Model	Reduced Model
Characteristics	Intensity	51.3 (1.93)		23.0 (1.60)		.0049* (2.17)		.0025 (1.11)	
	Duration	19.4 (.80)		50.9 (1.27)		.0009 (.42)		.0078 (1.24	
	Employer Mobility	124 (.31)		574 (1.43)		-.0022 (.07)		.1153 (1.84)	
	Intermittency	-470 (.70)		626 (1.30)		-.0402 (.71)		.1092 (1.45)	
Length	Months OLF	47.8 (.74)	37.2 (.58)	-8.32 (.93)	-9.58 (1.08)	.0046 (.84)	.0040 (.72)	-.0003 (.24)	-.0006 (.47)
	Experience	9.02 (.77)	14.8 (1.47)	1.25 (.12)	9.62 (1.13)	.0006 (.58)	.0008 (.97)	.0006 (.36)	.0021 (1.57)
	Tenure	47.6* (3.08)	55.7* (4.16)	-11.4 (.74)	-.423 (.04)	.0035* (2.72)	.0038* (3.40)	.00006 (.02)	.0018 (.97)
Control	1977 Hours	1.53 (.94)	3.36* (2.33)	3.13* (4.36)	3.56* (5.15)	.0003* (2.17)	.0004* (3.70)	.0006* (4.98)	.0006* (5.67)
	Education	1,567* (6.04)	1,405* (5.64)	570* (2.21)	429 (1.79)	.1124* (5.14)	.0966* (4.62)	.0641 (1.59)	.0511 (1.36)
	Promotion	3,304* (2.63)	3,541* (2.78)	1.351 (1.17)	1,137 (1.0)	.2007 (1.90)	.2200* (2.06)	.3132 (1.73)	.2632 (1.48)
	Intercept	-25,251	-18,872	-11,886	-3,797	6.15	6.79	5.71	6.80
	R^2	.576	.514	.373	.342	.543	.481	.39?	.371
	F	7.8	10.8	6.2	9.4	6.8	9.4	6.9	10.7
	n	68	68	116	116	68	68	116	116
	Decrement in R^2		-.062		-.031		-.062		-.027
	F-Statistic		2.08		1.30		1.94		1.16
	d.f.		4,57		4,105		4,57		4,105

*p < .05